

Chapter 16

Implementation Example for the Structured Mathematics Teaching in Learning Environments During the Pandemic Period

Eminer Nur Ünveren Bilgiç

 <https://orcid.org/0000-0001-9684-4192>

Sakarya University, Turkey

ABSTRACT

The purpose of the study is to provide exemplary work for academicians and field experts working in the field during the COVID-19 outbreak to effectively use technology in mathematics teaching environments in the distance education process and integrate it into teaching environments. Both the course content presented to prospective teachers and also the learning materials created by the prospective-teachers in line with the learning acquisitions of the course have become a part of the teaching process, and the teaching process has been structured by integrating both the course content and the prepared learning materials into the teaching process under the TPACK theory frame.

INTRODUCTION

The Covid-19 global outbreak has affected many industries all over the world, especially education. The pandemic process caught the education community unprepared and, unfortunately, globally created a state of severe crisis (Education International, 2020). Despite the warnings about the issue (White, et al, 2010), due to some continuing deficiencies in education (Briggs, 2018; GCPEA, 2018), the pandemic process has been the first global crisis occurring in the digital world (Bozkurt, Sharma, 2020). Some socio-cultural, economic, political consequences will arise after this crisis. The unforeseen effects of the rapid closing of schools around the world have affected many students. Globally more than 1.5 bil-

DOI: 10.4018/978-1-7998-7275-7.ch016

lion students of all ages have been reported to be affected by the closure of educational institutions due to COVID 19 (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2020a; United Nations International Children's Emergency Fund [UNICEF], 2020). The number of influenced students equals approximately 90% of enrolled students in the world (UNESCO, 2020a; 2020b).

Many educational institutions have switched to “emergency remote teaching” practice to minimize the impact of the pandemic on students (Bozkurt and Sharma 2020). Emergency remote teaching is defined as a sudden transformation of teaching distribution into an online delivery mode as a result of a big disaster, unlike online courses initially planned and designed to be delivered virtually (Hodges, et al, 2020). ERT involves the use of existing distance teaching tools to deliver curriculum or educational materials that would usually be delivered physically, as hybrid or blended courses. Once the disaster or catastrophe conditions no longer exist, the instructional presentation will revert to its original format. Given this situation, it is not difficult to interpret the relationship between ERT and online learning concepts. Although the idea of transference of conventional teaching to an online environment provides flexibility to the learning-teaching process for students and educators, this transformation took place very quickly due to the pandemic. Although many educational institutions argue that the pandemic process offers a revolutionary opportunity for transition to remote education applications (Common Wealth of Learning [COL], 2020; Organisation for Economic Co-operation and Development [OECD], 2020), the online education platforms of many higher education institutions can support a very small pool of faculty members (Hodges, Moore, Lockee, Trust and Bond, 2020). Moreover, in this process, it is observed that there are deficiencies in faculty members both to use technology effectively and to integrate technology into the existing curriculum (Bao, 2020, Mohmmmed, et al, 2020).

The Aim and Significance of the Study

Emergency remote teaching environments (ERTE) are the right solution to the crisis in the pandemic process. However, as a result of the rapid development of the process in question, it differs from any online learning environment due to inadequate planning and preparation (Hodges et al., 2020). Besides, the idea that using technology in education can overcome the problems experienced does not only arise in such ERTE situations (Mishra, Koehler, & Kereluik, 2009; Rushby, 2013; Teräs, et al, 2020).

Educational technologies consist not only of concrete technologies (e.g., computers, smartphones, learning management systems) but also of abstract technologies (e.g., educational theories, approaches, strategies) (Bozkurt, 2020). Therefore, one of the points that should be taken into account in the new “normal period” is the utilization of the abstract technologies reflecting the invisible part of educational technologies, as well as concrete technology-oriented solutions (Bozkurt, 2020).

Learning environments planned for realization through remote teaching have a unique process of planning, implementation, evaluation (Teräs, Kartoğlu, 2017; Williamson, Potter, Eynon, 2019). Due to the pandemic, the transformation of face-to-face teaching environments to remote education brought along also a very troublesome process. Because moving physical lessons to an online environment requires a systematic and planned understanding (Ali, 2020). It should not be forgotten in this case that the remote education process can be enriched not only with synchronous contents but also with asynchronous contents. As Bozkurt (2020) states, if we consider face-to-face lessons and remote education lessons as an equation, both sides of the equation are equal, but the variables composing the equation are different on both sides. For example, a two-hour face-to-face lesson can be equivalent to 20 minutes of synchronous lessons and alternative asynchronous activities that support this process. Another matter to be considered

24 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

www.igi-global.com/chapter/implementation-example-for-the-structured-mathematics-teaching-in-learning-environments-during-the-pandemic-period/276972

Related Content

Integration of E-Learning into Curriculum Delivery at University Level in South Africa

Rabelani Dagadaand Agnes Chigona (2013). *International Journal of Online Pedagogy and Course Design* (pp. 53-65).

www.irma-international.org/article/integration-learning-into-curriculum-delivery/75541

Perceptions of the Graduate Students on the Utilization of Quizizz in Virtual Classes

Marta Magadán-Díazand Jesús I. Rivas-García (2022). *International Journal of Online Pedagogy and Course Design* (pp. 1-15).

www.irma-international.org/article/perceptions-of-the-graduate-students-on-the-utilization-of-quizizz-in-virtual-classes/306687

Fostering Practical Developers in Computer Science Classrooms: A PBL Approach

Yin Zhang (2019). *Global Perspectives on Fostering Problem-Based Learning in Chinese Universities* (pp. 55-87).

www.irma-international.org/chapter/fostering-practical-developers-in-computer-science-classrooms/229373

Challenges and Future Strategies for B-Schools

Anatoly Zhuplev, Francisco J. Valle, José J. Rincónand Max Plithides (2025). *Insights Into International Higher Education Leadership and the Skills Gap* (pp. 381-428).

www.irma-international.org/chapter/challenges-and-future-strategies-for-b-schools/358809

Multi-Disciplinary Collaboration to Unravel Expert Knowledge: Designing for Effective Human-Computer Interaction

Elsbeth McKayand Jennifer Martin (2007). *Instructional Design: Case Studies in Communities of Practice* (pp. 309-329).

www.irma-international.org/chapter/multi-disciplinary-collaboration-unravel-expert/23959